UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,312	06/18/2001	Richard B. Keller	51040.P017	4827

25943	7590	02/06/2004

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EXAMINER
TRIMMINGS, JOHN P

ART UNIT	PAPER NUMBER
2133	4

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application Number	Applicant(s)
Office Action Summary	09/884,312	KELLER, RICHARD B.
	Examiner	Art Unit
	John P Trimmings	2133

-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 January 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-27</u> is/are pending in the application.

　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,4,5,7,10-13,15,16,18,20,21,23,24 and 26</u> is/are rejected.

7)☒ Claim(s) <u>3,6,8,9,14,17,19,22,25 and 27</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>06 November 2004</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Pri rity under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　a)☐ All b)☐ Some * c)☐ None of:

　　1.☐ Certified copies of the priority documents have been received.

　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

　a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4)☐ Interview Summary (PTO-413) Paper No(s). _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: .

DETAILED ACTION

This office action is in response to applicant's amendment, filed on 01/06/2004.

Claims 1-27 are pending, and are subject to examination.

Response to Amendment

1.   Applicant's amendments to claims 1, 15 and 20 are noted.

2.   Applicant's amendments to the Specification are noted.

3.   Applicant's corrections to drawing sheets 5 and 6 are noted and the examiner's

objections are withdrawn.

4.   Applicant's argument to examiner's objection of Claim 20 is persuasive, and is

withdrawn by the examiner.

Re: USC 112 Rejections

5.   Applicant's arguments of 01/06/2004 have been fully considered as follows:

As per Claims 2, 5, 6, 7, 9, 16, 17, 18, 24, 25 and 26:

      Applicant's argument to examiner's rejection of Claims 2 and 5 is

      persuasive, and is withdrawn by the examiner.

Re: USC 102 Rejections

35 USC 102(b) based on Shih

6.   Applicant's arguments of 01/06/2004 in regards to Claim 1 have been fully

considered as follows:

Applicant's argument to examiner's rejection of Claim 1 is persuasive, and

is withdrawn by the examiner.

Re: USC 102 Rejections

35 USC 102(b) based on NN901051

7.   Applicant's arguments of 01/06/2004 in regards to Claims 12-15 have been fully

considered as follows:

As per Claim 12:

The applicant argues that the results of the calculation of the CRC

assemblies (16 Bit or 8 Bit) are stored into a plurality of elements is neither

suggested, taught nor discussed. However, the examiner points to NN901051 in

the text on page 1 wherein it cites "the CRC register is composed of 16 Polarity

Hold-Shift Register Latches...". The drawing of Figure 1 of the reference does

not explicitly show the latches that are part of each CRC generator, however the

text teaches the storage latches in the above quotation (16 each) within each

generator and so storage is inherent to each CRC generator. The plurality of

storage units (16 or 8 bits) is therefore attached and is part of each generator,

and so the Claim 12 is <u>maintained</u> as being rejected.

As per Claims 13 and 15:

The applicant argues that these claims are dependent on Claim 12 above,

and thus for the same reasons should be withdrawn. However, the examiner in

rebutting Claim 12 above believes also that these claims, being dependent on

the claim above, should be maintained in view of this association and so for this

reason are <u>maintained</u> as being rejected.

Re: USC 103 Rejections

35 USC 103(a) based on Albertengo

8.   Applicant's arguments of 01/06/2004 in regard to Claim 20 have been fully

considered as follows:

      Applicant's argument to examiner's rejection of Claim 20 is persuasive,

and is withdrawn by the examiner.

Re: USC 103 Rejections

35 USC 103(a) based on Shih in view of NN901051

9.   Applicant's arguments of 01/06/2004 have been fully considered as follows:

As per Claims 2-6 and 8:

      Applicant's argument to examiner's rejection of Claims 2-6 and 8 is

persuasive, and is withdrawn by the examiner.

Re: USC 103 Rejections

35 USC 103(a) based on Shih

10.   Applicant's arguments of 01/06/2004 in regard to Claims 10-11 have been fully

considered as follows:

Applicant's argument to examiner's rejection of Claims 10-11 is

persuasive, and is withdrawn by the examiner.

Re: USC 103 Rejections

35 USC 103(a) based on Albertengo in view of Shih and further in view of

NN901051

11.   Applicant's arguments of 01/06/2004 in regard to Claims 21-23 have been fully

considered as follows:

Applicant's argument to examiner's rejection of Claims 21-23 is

persuasive, and is withdrawn by the examiner.

Re: USC 103 Rejections

35 USC 103(a) based on NN901051

12.   Applicant's arguments of 01/06/2004 in regard to Claim 19 have been fully

considered as follows:

Applicant's argument to examiner's rejection of Claim 19 is persuasive,

and is withdrawn by the examiner.

Re: USC 103 Rejections

35 USC 103(a) based on Albertengo in view of NN901051

13.   Applicant's arguments of 01/06/2004 in regard to Claim 27 have been fully

considered as follows:

Applicant's argument to examiner's rejection of Claim 27 is persuasive,

and is withdrawn by the examiner.

Drawings

14.   The drawings are objected to because Figure 4a depicts the CRC inputs from

Acc reads "32", and the examiner believes it should read "64". A proposed drawing

correction or corrected drawings are required in reply to the Office action to avoid

abandonment of the application. The objection to the drawings will not be held in

abeyance.

15.   The drawings are objected to because Figure 4b depicts incoming data as

"[64:0]", but the examiner believes it should read "[63:0]", and the CRC ~422 input from

Acc reads "32", and the examiner believes it should read, "40". Also, the examiner

believes that ~432 output "32" should read, "40", and ~426 requires output of "32"

should read, "8". A proposed drawing correction or corrected drawings are required in

reply to the Office action to avoid abandonment of the application. The objection to the

drawings will not be held in abeyance.

16.   The drawings are objected to because Figure 5a depicts bytes 4-1 as "[63:0]",

but the examiner believes that it should read, "[31:0]". Likewise, bytes 3-1 should read,

"[23:0]", bytes 2-1 should read, "[15:0]", and byte 1 should read, "[7:0]". A proposed

drawing correction or corrected drawings are required in reply to the Office action to

avoid abandonment of the application. The objection to the drawings will not be held in

abeyance.

17.   The drawings are objected to because Figure 5b depicts incoming data as

"[64:0]", but the examiner believes it should read "[31:0]", and the Mux ~530 output to

CRC ~522a reads "40", and the examiner believes it should read, "8". Also, the ~522a

input reads "32" and the examiner believes it should read, "8", and ~532 output reads

"32" and the examiner believes it should read, "24", and ~522b output should read. "8".

A proposed drawing correction or corrected drawings are required in reply to the Office

action to avoid abandonment of the application. The objection to the drawings will not

be held in abeyance.

18.   Claims 3, 6, 8, 9, 14, 17, 19, 22, 25, and 27 are objected to as being dependent

upon a rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19.   Claims 1, 2, 4, 5, 7, 12, 13, 15, 16, and 18 are rejected under 35 U.S.C. 102(b)

as being anticipated by "High Speed Parallel Cyclic Redundancy Check Generator",

IBM Technical Disclosure Bulletin NN901051, Vol. 22, Issue 5, pp 51-56, October 1,

1990.

As per Claims 1 and 12:

NN901051 teaches and apparatus and method, specifically a data word extractor (see Fig. 1 input block selector/extractor with Bus Low/Bus High inputs) which extracts word groups one at a time, having a size of n bytes (see 1st page; "frame size that is a multiple of eight bits is assumed"), a plurality of CRC calculation assemblies (see Fig. 1 where two CRC calculators are shown) coupled to the extractor (Fig. 1) and selectively employed to iteratively perform a CRC calculation (Fig. 1 Bus Low/Bus High inputs to extractor and text page 2 beginning at line 3), based on size of the word (see also page 2 beginning at line 3), storage elements connected to CRC calculators (see page 1 last two line; "the CRC register is composed of 16 Polarity Hold-Shift Register Latches"), and selectors (Fig. 1 'Gate 8 or 16 Data Bit CRC' block and 'CRC Register' block) coupled to storage elements to selectively recirculate stored results back to the CRC generators (Fig. 1) and to output results (page 2 line 8; "after all has been run through the register, it may then be read...").

As per Claims 2 and 13:

Dependent on Claims 1 and 12 above, NN901051 further teaches a 1st calculation assembly (Fig. 1 '8 Data Bit CRC Logic') coupled to the extractor of Claim 1 and 12 above which calculates the CRC of the 1st group (page 2 lines 3-30) whenever n/2 words (in this example of Fig. 1 the value is 2/2) are extracted, and so Claims 2 and 13 are rejected.

As per Claims 4 and 15:

Dependent on Claims 2 and 13 above, NN901051 further teaches the 1st calculation assembly (Fig. 1 '8 Data Bit CRC Logic') comprises n/2 calculators (in this example of Fig. 1 the value is 2/2) which calculates the CRC of the 1st group (Fig. 1 Bus Low/Bus High, and page 2 line 3-30) whenever n/2 words (in this example of Fig. 1 the value is 2/2) are extracted, and so Claims 4 and 15 are rejected.

As per Claims 5 and 16:

Dependent on Claims 2 and 13 above, NN901051 further teaches a 2nd calculation assembly (Fig. 1 '16 Data Bit CRC Logic') coupled to the extractor of Claims 1 and 13 above which calculates the CRC of the 2nd group (page 2 line 3; "The data bus enable signals gate the data bus") whenever more than n/2 words (in this example of Fig. 1 the value is >2/2 and so is equal to 2 bytes) are extracted, and so Claims 5 and 16 are rejected.

As per Claims 7 and 18:

Dependent on Claims 5 and 16 above, NN901051 further teaches the 2nd calculation assembly (Fig. 1 '16 Data Bit CRC Logic') comprises n/2 calculators (in this example of Fig. 1 the value is 2/2) which calculates the CRC of the 1st group (Fig. 1 Bus Low/Bus High, and page 2 line 3; "The data bus enable signals gate the data bus") whenever >n/2 words (in this example of Fig. 1 the value is >2/2 and so is equal to 2 bytes) are extracted, and so Claims 7 and 18 are rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

20.   Claims 10 and 20, 21, 23, 24, and 26 are rejected under 35 U.S.C. 103(a) as

being unpatentable over "High Speed Parallel Cyclic Redundancy Check Generator",

IBM Technical Disclosure Bulletin NN901051, Vol. 22, Issue 5, pp 51-56, October 1,

1990, and in view of "Parallel CRC Generation", Guido Albertengo et al., IEEE Micro

0272-1732/90/1000-0063501.00, October, 1990, pp 63-71.

As per Claim 10:

Dependent on Claim 1 above, this claim limits the apparatus to n equals 8. In the

Claim 1 reference, NN901051 teaches all of the conditions of that claim, and also

teaches n equals 2 as an example (see Fig. 1), but does limit the apparatus strictly to

that number (page 1; "a frame size that is a multiple of eight bits is assumed"). In an

analogous art, Alberengo et al. in page 1 2nd paragraph summarizes the advantages of

parallel CRC generation as being faster than conventional, and allows one CRC circuit

to be shared by several lines. In view of this motivation to improve speed, one with

ordinary skill in the art at the time of the invention would be inclined to combine the prior

art teachings to include any number of calculation stages as would be appropriate. In

this case, 8 bytes of processing power would be a better multiple of the stages than 2

bytes. And so, based on the above references, and with reference also to *In re Harza,*

2744 F.2d 669, 671, I24 USPQ 378, 380 (CCPA 1960), this claim is rejected as being

obvious.

As per Claim 20:

The applicant's claim of an apparatus comprising a shared CRC generation block

with all of the characteristics as has extant been rejected in Claim 1 under 35 USC

102(b) above is taught by NN901051. However, this reference does not specify a

plurality of processor units for processing network traffic. In an analogous art,

Albertengo et al. does teach combining a CRC generator in line with the data flow (page

70 column 1 last 2 paragraphs) in an analogous router (page 70 column 2 paragraph 3),

as is claimed by the applicant. Among the advantages of combining the two, Albertengo

in page 63 2nd paragraph cites the improved processing speed and the advantage of

sharing several lines with the CRC generator. One with ordinary skill in the art at the

time of the invention, motivated by Albertengo as suggested above, would combine the

two references for the improvements cited, and so the claim is rejected.

As per Claims 21, 23, 24, and 26:

These claims derive their dependency and motivation from Claim 20 above.

Except for the network router limitation of Claim 20 above, these claims are the same as

Claims 2, 4, 5, and 7, and so are similarly rejected as being obvious.

21.   Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over "High

Speed Parallel Cyclic Redundancy Check Generator", IBM Technical Disclosure Bulletin

NN901051, Vol. 22, Issue 5, pp 51-56, October 1, 1990, and in view of Shih et al., U.S.

Patent No. 4937828. Dependent on Claim 1 above, this claim limits the apparatus of

Claim 1 to being an integrated circuit. While NN901051 teaches all of the aspects of

Claim 1, it does not specify reducing the apparatus down to an integrated circuit.

However, in an analogous art, Shih et al. teaches the objective of providing the CRC

generator apparatus of that invention using a single integrated circuit (column 1 lines

55-59). The benefits to this are stated in column 1 lines 42-47 of Shih et al. as providing

parallel CRC generation without additional space or time delay. One with ordinary skill

in the art at the time of the invention, motivated to make a faster smaller apparatus as

suggested by Shih et al., would combine the two references above, and so the claim is

rejected.

Allowable Subject Matter

22.   Claims 3, 14, and 22 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims. The following is a statement of

reasons for the indication of allowable subject matter: This claims, being dependent on

Claims 2, 13, and 21, cascade a number of CRC generators ($<n/2$) in a selective manner when there are $n/2$ bytes. The prior art of NN901051 teaches all of this except the cascading of $<n/2$ generators ($<n/2 = 0$). Also, the prior arts of record taken alone, or in combination failed to teach, anticipate, suggest, or render obvious the claimed invention of the application. Specifically, the prior arts failed to teach, anticipate, suggest, or render obvious the cascading of $<n/2$ generators of the invention. Consequently, Claims 3, 14 and 22 are allowed over the prior arts of record but are objected to as being dependent upon a rejected claim.

23.   Claims 6, 17, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: This claim, being dependent on Claims 5, 16 and 24, limit the 2nd generator of that claim to comprise $<n/2$ calculators to be employed in the CRC generation when there are $>n/2$ bytes. The prior art of NN901051 teaches all of this except the use of $<n/2$ generators which in the reference would mean that there would be zero number of generators. Also, the prior arts of record taken alone, or in combination failed to teach, anticipate, suggest, or render obvious the claimed invention of the application. Specifically, the prior arts failed to teach, anticipate, suggest, or render obvious the use of $<n/2$ generators of the invention. Consequently, Claims 6, 17 and 25 are allowed over the prior arts of record but are objected to as being dependent upon a rejected claim.

24.   Claims 8, 19, and 27 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims. The following is a statement of

reasons for the indication of allowable subject matter: This claim, being dependent on

Claims 2, 13 and 21, further limits the extractor to selecting a 2nd group of words, and a

2nd CRC assembly to be employed in the CRC generation when there are n/2 bytes.

The prior art of NN901051 teaches all of this except the use of 2 generator assemblies

used for 2 separate computations. Also, the prior arts of record taken alone, or in

combination failed to teach, anticipate, suggest, or render obvious the claimed invention

of the application. Specifically, the prior arts failed to teach, anticipate, suggest, or

render obvious the use of these 2 generator assemblies when there are n/2 bytes in the

invention. Consequently, Claims 8, 19 and 27 are allowed over the prior arts of record

but are objected to as being dependent upon a rejected claim.

25.   Claim 9 is objected to as being dependent upon a rejected base claim, but would

be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims. The following is a statement of reasons for the

indication of allowable subject matter: This claim, being dependent on Claim 1, further

limits the apparatus 1st selector to being coupled to the storage elements and

recirculating back to the calculators, and the 2nd selector coupled to the 1st selector to

output the result. The prior art of NN901051 teaches all of this except the coupling of

the 1st selector to the calculator for recirculation of the data. Also, the prior arts of record

taken alone, or in combination failed to teach, anticipate, suggest, or render obvious the

claimed invention of the application. Specifically, the prior arts failed to teach, anticipate, suggest, or render obvious the use of recirculating data via the 1st selector output. Consequently, Claim 9 is allowed over the prior arts of record but is objected to as being dependent upon a rejected claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P Trimmings whose telephone number is 703-305-0714. The examiner can normally be reached on weekdays, 7:30 AM to 4:00 PM.
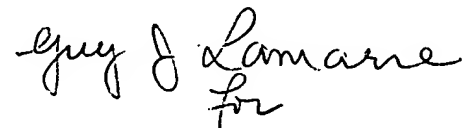
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on 703-305-9595. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-2394.

John P Trimmings
Examiner
Art Unit 2133

Jpt

Albert DeCady
Primary Examiner